



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/000,009	12/04/2001	Masayuki Saito	108384-00005	7966

6449 7590 09/10/2003

ROTHWELL, FIGG, ERNST & MANBECK, P.C.  
1425 K STREET, N.W.  
SUITE 800  
WASHINGTON, DC 20005

EXAMINER

ZERVIGON, RUDY

ART UNIT

PAPER NUMBER

1763

DATE MAILED: 09/10/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/000,009

Applicant(s)

SAITO, MASAYUKI

Examiner

Rudy Zervigon

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 June 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) 8 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election of Group I, Claims 1-7 in Paper No. 6 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

### ***Claim Rejections - 35 USC § 103***

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. Claims 1-7, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujikawa et al (USPat. 5,704,214) in view of Calton et al (USPat. 5,649,428). Fujikawa teaches a CVD apparatus (Figure 1; column 3, lines 43-65) comprising:
  - i. a container (16, 18; Figure 1; column 3, lines 59-65) for accommodating a organometallic compound ("TDEAT"; column 3, lines 43-48), the compound serving as a raw material; a heating means (30; column 4, lines 1-9) for heating the container (16, 18; Figure 1; column 3, lines 59-65) and vaporizing the organometallic compound (TDEAT) to obtain a raw material gas; a reactor (4; Figure 1) for accommodating a substrate ("W") on which a thin film is deposited (TiN); an exhaust pump (46; column 4, lines 15-20) for maintaining a low pressure atmosphere (200mTorr; column 6, lines 25-30) within the reactor (4; Figure 1); and a trap (40; sometimes referred to as a "tramp" or "removing apparatus") provided on the upstream of the exhaust pump (46; column 4, lines 15-20) and cooling used raw material gas supplied from the reactor (4; Figure 1)

- ii. 4. The LPCVD apparatus (Figure 1; column 3, lines 43-65) according to claim 1, wherein the apparatus (Figure 1; column 3, lines 43-65) is provided with a trap-pressure-regulating valve (44) for adjusting the internal pressure in the trap, the regulating valve being located between the trap (40; sometimes referred to as a “tramp” or “removing apparatus”) and the exhaust (46; column 4, lines 15-20)
- iii. 5. The LPCVD apparatus (Figure 1; column 3, lines 43-65) according to claim 1, wherein the apparatus (Figure 1; column 3, lines 43-65) is provided with a back-flow valve (38; column 4, lines 15-20) for preventing a back flow of the used raw material in the trap, the back-flow valve (38; column 4, lines 15-20) being located between the reactor (4; Figure 1) and the trap.
- iv. 6. The LPCVD apparatus (Figure 1; column 3, lines 43-65) according to claim 1, wherein the apparatus (Figure 1; column 3, lines 43-65) is connected with a first (36) and a second (containing bellows 48) pipes and provided with a by-pass pipe (50) which bypasses the trap (40; sometimes referred to as a “tramp” or “removing apparatus”), the first pipe (36) connecting the reactor (4; Figure 1) and the trap (40; sometimes referred to as a “tramp” or “removing apparatus”) and the second pipe (containing bellows 48) connecting the trap (40; sometimes referred to as a “tramp” or “removing apparatus”) and the (46; column 4, lines 15-20) and the pump (46)
- v. 7. The LPCVD apparatus (Figure 1; column 3, lines 43-65) according to claim 1 wherein the by-pass pipe (50) is provided at one portion thereof with a back-flow valve (52)

Fujikawa does not teach:

Art Unit: 1763

- vi. that his trap (40; sometimes referred to as a “tramp” or “removing apparatus”) is provided with a honeycomb-structure cylindrical fillers in a flowing passage through which the used raw material flows
- vii. the length of the honeycomb-structure cylindrical fillers is in a range of 0.01 to 1.0 m in a direction along which the used raw material flows
- viii. the honeycomb-structure cylindrical fillers have holes with a maximum diameter of 0.5 to 10 mm
- ix. the by-pass pipe (50) is provided at the both ends thereof with a back-flow valve
- x. metallic cylindrical fillers

Calton teaches a gas trap (“moisture transfer wheel”; 52; column 7, lines 20-25, 60-67) with a honeycomb structure (Figure 3). Specifically, Calton teaches a trap (52) is provided with a honeycomb-structure (Figure 3) cylindrical fillers (14) in a flowing passage through which material flows

It would have obvious to one of ordinary skill in the art at the time the invention was made to:

- i. replace Fujikawa’s gas trap with Calton’s gas trap with a honeycomb structure, including metallic cylindrical fillers - Motivation to replace Fujikawa’s gas trap with Calton’s gas trap with a honeycomb structure, including metallic cylindrical fillers, is to increase the heat transferred to the trap as taught by Calton (column 4, lines 15-20; column 9, lines 4-16) and for providing an alternate and equivalent material of construction

Art Unit: 1763

- ii. change the dimensions of the Calton's honeycomb structure to influence the surface area -  
Motivation to change the dimensions of the Calton's honeycomb structure to influence the surface area is to increase the heat transferred to the trap as taught by Calton (column 4, lines 15-20; column 9, lines 4-16). Additionally, it is well established that changes in apparatus dimensions are within the level of ordinary skill in the art.(Gardner v. TEC Systems, Inc. , 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied , 469 U.S. 830, 225 USPQ 232 (1984); In re Rose , 220 F.2d 459, 105 USPQ 237 (CCPA 1955); In re Rinehart, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); See MPEP 2144.04)
- iii. add a second back flow valve to Fujikawa's by-pass pipe (50) that already has one back flow valve (52) - Motivation to add a second back flow valve to Fujikawa's by-pass pipe (50) that already has one back flow valve (52) is to provide additional piping line isolation. Further, it is well established that the duplication of parts is obvious (In re Harza , 274 F.2d 669, 124 USPQ 378 (CCPA 1960) MPEP 2144.04).

### ***Response to Arguments***

1. Applicant's arguments filed July 1, 2003 are not persuasive
2. Applicant states that "It is impossible to use a honeycomb structure in the trap of Fujikawa et al. because TDEAT, having high viscosity at room temperature, would cause blockage in a honeycomb structure trap.". Applicant's argument is mute on several grounds. First, Applicant's argument is directed to how Fujikawa uses his CVD apparatus, because as Applicant points out "Fujikawa's apparatus intends to produce TiN thin film, wherein TDEAT is used as a raw material.", however, Fujikawa's CVD apparatus is not strictly limited to forming TiN thin films and thusly includes numerous thin film products with a corresponding array of

Art Unit: 1763

precursors and associated viscosities as taught by Fujikawa (column 1, lines 11-21). It has been established that apparatus claims must be structurally distinguishable from the prior art (In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997) MPEP 2114). Second, even if Fujikawa's TDEAT precursor were at a high enough viscosity to cause "blockage" as Applicant suggests, and of which there is no evidence in any of the applied references and in Applicant's disclosure, Fujikawa's apparatus can simply increase the temperature of the precursor component in the effluent by Fujikawa's passage heating means (62; column 4, lines 31-35) and thereby decreasing the viscosity of the effluent defeating any possible "blockage".

3. Applicant's identification that Fujikawa "recognizes the limitations of the gas trap in their invention as the reference discloses that the choices for the angle of the fins is limited in that at a certain angle the flow speed diminishes" (page 6, second paragraph) lends support for the Examiner's basis for motivation as stated in the prior action:

"

It would have obvious to one of ordinary skill in the art at the time the invention was made to: replace Fujikawa's gas trap with Calton's gas trap with a honeycomb structure - Motivation to replace Fujikawa's gas trap with Calton's gas trap with a honeycomb structure is to increase the heat transferred to the trap as taught by Calton (column 4, lines 15-20; column 9, lines 4-16)

"

4. In response to applicant's argument that Calton is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order

Art Unit: 1763

to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Calton is both in the field of applicant's endeavor (gas traps) and is reasonably pertinent to the particular problem with which the applicant was concerned – collecting condensed gas (“moisture transfer wheel”; 52; column 7, lines 20-25, 60-67).

5. Applicant's statement that Calton's moisture transfer wheel is not a gas trap is not convincing according to Calton's teaching (column 3, lines 7-13).

6. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, motivation to replace Fujikawa's gas trap with Calton's gas trap with a honeycomb structure is to increase the heat transferred to the trap as taught by Calton (column 4, lines 15-20; column 9, lines 4-16). Further, as suggested by Applicant, Fujikawa “recognizes the limitations of the gas trap in their invention as the reference discloses that the choices for the angle of the fins is limited in that at a certain angle the flow speed diminishes” (page 6, second paragraph) thus supporting the exchange between Fujikawa's gas trap with Calton's gas trap.

7. In response to Applicant's argument that it would not be obvious to one of ordinary skill in the art to change the dimensions of the Calton's honeycomb structure to influence the surface area - Motivation to change the dimensions of the Calton's honeycomb structure to influence the



Art Unit: 1763

surface area is to increase the heat transferred to the trap as taught by Calton (column 4, lines 15-20; column 9, lines 4-16) and thereby the increasing the condensation of the gas on the surface of Calton's trap.

### ***Conclusion***

8. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (703) 305-1351. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 7pm. The official after final fax phone number for the 1763 art unit is (703) 872-9311. The official before final fax phone number for the 1763 art unit is (703) 872-9310. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (703) 308-0661. If the examiner

Application/Control Number: 10/000,009

Page 9

Art Unit: 1763

can not be reached please contact the examiner's supervisor, Gregory L. Mills, at (703) 308-1633.

A handwritten signature in black ink, appearing to read 'Jeffrie R. Lund', with a stylized, cursive script.

**JEFFRIE R. LUND  
PRIMARY EXAMINER**